

**PATENT APPLICATION**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of Docket No: Q78609

Katsura ITO, et al.

Appln. No.: 10/725,327 Group Art Unit: 1754

Confirmation No.: 2696 Examiner: NGUYEN, Cam N.

Filed: December 2, 2003

For: PHOTOCATALYTIC POWDER, PHOTOCATALYTIC SLURRY, AND POLYMER COMPOSITION, COATING AGENT, PHOTOCATALYTIC FUNCTIONAL MOLDED ARTICLE AND PHOTOCATALYTIC FUNCTIONAL STRUCTURE USING THE POWDER

**SUBMISSION OF EXECUTED DECLARATION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicants attach hereto an executed version of the Declaration Under 37 C.F.R. § 1.132 that was submitted with the submission Under 37 C.F.R. § 1.114(c) filed on June 21, 2007.

Respectfully submitted,

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Date: June 29, 2007

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**DECLARATION UNDER 37 C.F.R. § 1.132**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Masayuki SANBAYASHI, hereby declare and state:

THAT I am a citizen of Japan;

THAT I graduated from the Department of Metallurgy, Graduate School of Engineering, Tohoku University;

THAT I began my employment with SHOWA DENKO K.K. in 1988, where I worked in Development of Ceramics Products from 1988 to 1994, in Development for Super High Pressure Products from 1994 to 1997, in Development for Grinding Material Products from 1997 to 1999, in Development of Photo Catalyst Products from 1999 until the present, and I moved to SHOWA TITANIUM CO., LTD. in 2001, where I currently hold the position of R&D Group Leader; and

THAT I am familiar with the prosecution of this application, including the final Office Action mailed August 21, 2006 and the Advisory Action mailed March 13, 2007.

THAT I am the same Masayuki Sanbayashi who is the Declarant of the Declaration Under 37 C.F.R. § 1.132 signed on February 16, 2007 and filed with the Response Under 37 C.F.R. § 1.116 on February 21, 2007, hereafter "Declaration I."

In Declaration I, I declared that the photocatalytic powder of Example 1 of U.S. Patent 6,479,141 ("Sanbayashi et al") does not contain titanium dioxide fine particles wherein the fine particles have an electrokinetic potential of from about -100 mV to -10 mV in an aqueous environment at pH 5, and set forth an experiment in support thereof.

I now set forth in further detail the experiment that was performed by me and/or under my supervision.

1. Coating Composition

A Coating Composition was prepared by the method of Example 1 of U.S. Patent 6,479,141 to Sanbayashi et al.

Ion exchange water was added to titanium tetrachloride (99.9% purity, supplied by Sumitomo Titanium Corporation) in a reactor with a water-cooling jacket for temperature control, to thereby prepare an aqueous titanium tetrachloride solution having a concentration of 0.25 mol/L. During preparation, the temperature control prevented the temperature of the titanium tetrachloride solution from elevating by reactive heat to a temperature over 50°C.

The obtained aqueous solution (1 L) was placed in a reactor equipped with a reflux condenser, heated to a temperature near the boiling point (101°C), and maintained at the temperature for 60 minutes for undergoing hydrolysis, to thereby prepare a water-dispersed titanium dioxide sol.

After the sol was condensed by decantation and hydrochloric acid removed by an electric dialysis machine, a water-dispersed titanium dioxide sol (A), having a titanium dioxide concentration of 20% and a pH of 2, was obtained. The titanium dioxide had an average particle size of 0.03  $\mu\text{m}$  measured by ELS-800(supplied by OTSUKA ELECTRONICS CO., LTD.), and a specific surface area of 128  $\text{m}^2/\text{g}$  measured by BET method.

To the water-dispersed titanium dioxide sol (A) (25g) were added an aqueous zirconium hydroxychloride solution with a concentration of 20% as reduced to zirconia (1.25g) and pure water (73.75g). Aluminum oxide particles having an average secondary particle diameter of 0.2  $\mu\text{m}$  (Alumina Oxide C, supplied by Nippon Aerosil Co., Ltd.) (0.05g) were added thereto. The mixture was dispersed thoroughly by an ultrasonic bath, to thereby prepare a Coating Composition. The pH of the obtained Coating Composition was 2.

## 2. Evaluation of Electrokinetic Potential

The electrokinetic potential was then evaluated in the same manner as set forth in the present specification.

The pH of the Coating Composition was adjusted to 5 by ammonia solution. A part of the composition was sampled and measured on the electrokinetic potential using the commercially available electrokinetic potential measuring apparatus DELSA440 (manufactured by Beckman Coulter, Inc.) and found to be +37.8 mV.

## 3. Conclusion

The measured result of 37.8 mV is not within the range of the -100 mV to -10 mV in claim 2 of the present application.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these

DECLARATION UNDER 37 C.F.R. § 1.132  
Application No. 10/725,327

Attorney Docket No. Q78609

statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: Jun. 27, 2007

Masayuki - Sanbayashi  
**Masayuki SANBAYASHI**